ABSTRACT

A process of producing polyethylene, the process comprising copolymerizing ethylene and an alpha-olefinic comonomer comprising from 3 to 8 carbon atoms in the presence of a chromium-based catalyst in a main polymerization reactor and, in a gas-phase preliminary reactor upstream of the main polymerization reactor, chemically treating the chromium-based catalyst with at least one treatment agent prior to introduction of the catalyst into the main polymerization reactor and releasing from the preliminary reactor waste gases produced during the chemical treatment. An apparatus for producing polyethylene, the apparatus comprising a main reactor having an inlet for receiving gaseous olefin monomer and an outlet for outputting polyethylene, and a preliminary reactor connected to a second inlet of the main reactor, the preliminary reactor being arranged to be operable in the gas phase and having at least one respective inlet for receiving a solid catalyst and at least one treatment agent and a respective outlet for releasing waste gases from the preliminary reactor.